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A taxonomic study of the genus *Tuarega* Uvarov, 1943 with descriptions of two new species from Sahara (Orthoptera: Acridoidea, Pamphagidae, Prionotropisinae)

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Abstract: This paper deals with a taxonomic study of the genus *Tuarega* Uvarov, 1943, with 2 new species, namely *Tuarega sahara* sp. nov. and *Tuarega parisi* sp. nov., from Sahara described. *T. sahara* sp. nov. is similar to *T. insignis* (Lucas, 1851), but it differs from the latter in four characters: the widest width of pronotum longer than length of metazona, median vein of tegmen not combined with cubital vein, radius vein of tegmen with 5 branches, cubital vein of tegmen with 2 branches. *T. parisi* sp. nov. is similar to *T. insignis*, but it differs from the latter in four characters: the widest width of pronotum longer than length of metazona, median vein of tegmen not combined with cubital vein, median vein of tegmen with 2 branches, cubital vein of tegmen with 2 branches. It is also similar to *T. sahara* sp. nov., but it differs from the latter by radius vein of tegmen with 7 branches and median vein of tegmen with 2 branches. A key to all known species of *Tuarega* is given. The type specimens are deposited in the Spanish National Museum of Natural Sciences (Museo Nacional de Ciencias Naturales, MNCN).

Key words: Orthoptera; Pamphagidae; *Tuarega*; taxonomy; new species

The genus *Tuarega* was erected by Uvarov in 1943. The type species is *Tuarega insignis* (Lucas, 1851) = *Oedipoda insignis* Lucas, 1851. According to the Orthoptera Species File Online, the genus *Tuarega* Uvarov, 1943 belongs to subfamily Akicerinae, family Pamphagidae, and there is only one species in the genus (Eades *et al.*, 2010). The type locality is Northern Africa, Algeria, Kefoum-Tebouc. Based on the main characters (antennae filiform, middle tibia on dorsal side with row of tubercles and hind tibia with apical spine on inner and outer side) and the taxonomic system of Pamphagidae (Zhang *et al.*, 2003), we suggest that the genus *Tuarega* should belong to subfamily Prionotropisinae, since the antennae of subfamily Akicerinae are ensiform.

During the identification of grasshopper specimens of *Tuarega* deposited in Spanish National Museum of Natural Sciences (Museo Nacional de Ciencias Naturales, MNCN), 2 new species are found and described below. A key to all known species of *T. uarega* is also given below. The type specimens are deposited in the Spanish National Museum of Natural Sciences (Museo Nacional de Ciencias Naturales).

Genus *Tuarega* Uvarov, 1943

Tuarega Uvarov, 1943, *Trans. R. Entomol. Soc. Lond.*, 93(1): 47; Johnston, 1956, Annotated Catalogue of African Grasshoppers: 63; Johnston, 1968, Annotated Catalogue of African Grasshoppers Supplement: 62; Otte, 1994, Orthoptera Species File 3: 163; Yin *et al.*, 1996, A Synonymic Catalogue of Grasshoppers and Their Allies of the World (Orthoptera: Caelifera): 732; Usmani, 2007, *Zootaxa*, 1625: 49, 55; Usmani, 2008, *Zootaxa*, 1946: 13.

Type species: *Tuarega insignis* (Lucas, 1851).

Body large and robust; integument strongly rugose; fastigium of vertex short, wide, slightly sloping forwards and slightly concave, with fastigial furrow obliterated; antennae filiform, slightly shorter than head and pronotum together; pronotum in prozona almost cylindrical, metazona flatted, median carina weak, linear, crossed by three weak sulci, lateral carinae absent, metazona longer than prozona, its posterior margin elongated and angular, with obtuse apex; prosternum with very low collar;

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mesosternal interspace more than twice as wide as its length; tegmina and wings fully developed; tibia of second leg with a row of tubercles on upper side; hind femur moderately robust, with slightly expanded marginal areas; hind tibia with small apical spines on inner and outer side; arolium small; subtympanal lobe large; Krauss' organ developed; first abdominal tergite above with large, ridge-like convexity. Male supra-anal plate elongate-angular; cerci narrow, incurved. Ovipositor moderately short, slender, with acute curved valves lower valve with large projection on the basal part.

The genus is distributed in North Africa (Algeria and Libya) only.

Key to species of genus *Tuarega* Uvarov, 1943

1 The widest width of pronotum longer than length of metazona, tegmen median vein (M) not combined with cubital vein and cubital vein (Cu) of tegmen with 2 branches only ····· **2**

– The widest width of pronotum shorter than length of metazona, tegmen median vein (M) combined with cubital vein (Cu) at end and cubital vein of tegmen with 3 branches ····· ***T. insignis* (Lucas, 1851)**

2 Tegmen radius vein (R) with 5 branches, median vein (M) with 1 branch only ····· ***T. sahara* sp. nov.**

– Tegmen radius vein (R) with 7 branches, median vein (M) with 2 branches ····· ***T. parisi* sp. nov.**

1 *Tuarega insignis* (Lucas, 1851)

Tuarega insignis Uvarov, 1943, *Trans. R. Entomol. Soc. London*, 93(1): 47; Chopard, 1954, *Bull. Soc. entomol. Fr.*, 59: 10; Dirsh, 1956, *Trans. R. Entomol. Soc. London*, 108 (7): 223; Dekeyser & Villiers, 1956, *Mem. Inst. franc. Afr. Noire*, 44: 1; Johnston, 1956, Annotated Catalogue of African Grasshoppers: 64; Korsakoff, 1958, *Eos*, 34: 135; Dirsh, 1965, The African Genera of Acridoidea: 86; Johnston, 1968, Annotated Catalogue of African Grasshoppers Supplement: 62; Descamps, 1970, *Bull. Soc. entomol. Fr.*, 75: 34; Otte, 1994, Orthoptera Species File 3: 163; Yin *et al.*, 1996, A Synonymic Catalogue of Grasshoppers and Their Allies of the World (Orthoptera: Caelifera): 732; Massa & Rizzo, 1998, *Ann. Mus. Civ. Stor. Nat. Genova*, 92: 280; Mestre & Chiffaud, 2006, Catalogue et atlas des acridiens d'Afrique de l'Ouest: 297; Usmani, 2007, *Zootaxa*, 1625: 55; Usmani, 2008, *Zootaxa*, 1946: 13; Massa, 2009, *Jour. Orth. Res.*, 18 (1): 80.

Batrachotetrix elephas Saussure, 1884, *Mem. Soc. Phys. Hist. Nat. Geneve*, 28(9): 236≫Syn.

Eremocharis insignis Krauss, 1892, *Wiener Entomol. Z.*, 11 (5): 149; Kirby, 1910, A Synonymic Catalogue of Orthoptera (Orthoptera Saltatoria, Locustidae vel Acridiidae), 3(2): 290; Chopard, 1943, Faune de l'Empire Français, 1: 334.

Eremobia jaminii Lucas, 1853, *Ann. Soc. ent. Fr.*, 3(1): 65≫Syn.

Oedipoda insignis Lucas, 1851, *Ann. Soc. ent. Fr.*, 9(2): 370.

Location of type: MNHN France, Paris, Muséum National dHistoire Naturelle (Holotype female).

Measurements (in mm): Length of body: ♀ 75.0. Wings expanding: ♀ 125.0.

Diagnosis: Widest width of pronotum shorter than length of metazona. In tegmen, median vein combined with cubital vein at end, radius vein with 7 branches, median vein with 1 branch only, cubital vein with 3 branches.

Distribution: Algeria (Kefoum-Tebouc – type locality) and Libya only

2 *Tuarega sahara* sp. nov. (Fig. 1: A, B, C, D, E)

Holotype ♂, Mehangat, Seguiat el mamara, Sahara Espanol collected by J. Mateu in March 23, 1944 (MNCN_Ent N°Cat 37043). Paratypes: 1 ♂ Doar, Seguiat el Hamara, Sahara Espanol, collected by J. Mateu in April 4, 1945 (MNCN_Ent N°Cat 37054); 1 ♂ Smara, Seguiat el Mamara, Sahara Espanol, collected in July 20, 1943 (MNCN_Ent N°Cat 37040); 1 ♀ Beni-Abbes, Sahara Algeria, collected by J. Mateu in March 27, 1951 (MNCN_Ent N°Cat 37008).

Male (Fig 1: A, E). Body large in size. Integument strongly rugose and dense hairs, especially on the hind leg. Head subglobular, shorter than length of pronotum; fastigium of vertex short, wide, slightly sloping forwards and slightly concave, with fastigial furrow obliterated; frons vertical; frontal ridge low, above ocellus flat and below it concave, in basal part obliterated. Eyes oval, the longitudinal diameter 1.3 – 1.4 times the horizontal diameter and equal to or slightly longer than subocular suture. Antennae filiform, slightly shorter than head and pronotum together, length of a segment 1.5 – 2.0 times width in the middle part. Pronotum in prozona almost cylindrical, metazona flatted; median carina weak, linear, crossed by three weak sulci; lateral carinae absent; metazona longer than prozona; its posterior margin elongated and angular, with obtuse apex; widest width of pronotum longer than length of metazona. Prosternum with very low collar. Mesosternal interspace more than twice as wide as its length. Tegmina and hind wings fully developed, surpassing the end of abdomen distinctly. Tegmina radius vein (R) with 5 branches, median vein (M) with 1 branches, cubital vein (Cu) not combined with median vein, cubital vein with 2 branches only. Tibia of second leg with a row of tubercles on upper side. Hind femur moderately robust, with slightly expanded marginal areas, length almost equal to 3 times width of broadest part. Hind tibia with small apical spine

on inner and outer side, with 8 – 9 spines on upper margin of outer side and 9 spines on inner side (including apical spine). Arolium small. Subtympanal lobe large. Krauss' organ developed. First abdominal tergite above with large, ridge-like convexity. Supra-anal plate elongate-angular, whole length with longitudinal groove. Cerci thin, incurved, with tined apex, length beyond the tip of supra anal plate. Epiphallus see Fig. 1: E.

Female (Fig. 1: B, C, D). Body larger and thick. Eyes oval, the longitudinal diameter 1.4 times the horizontal diameter and shorter than the length of subocular suture slightly. Antennae filiform, length of a segment 2.0 times width in the middle part. Cerci short, apex obtuse. Ovipositor moderately short, slender, valves curved, apex pointed; lower valve with large projection on the basal part.

Coloration. Body yellowish-brown. Eyes dark brown. Tegmina yellowish-brown. Hind wings yellow at base, with a dark strongly curved band reaching from the apical fourth to the posterior margin, but not touching the outer margin, apical part smoky. Hind femora yellowish-brown on outer side, inner genicular lobe red at base. Hind tibiae yellowish-

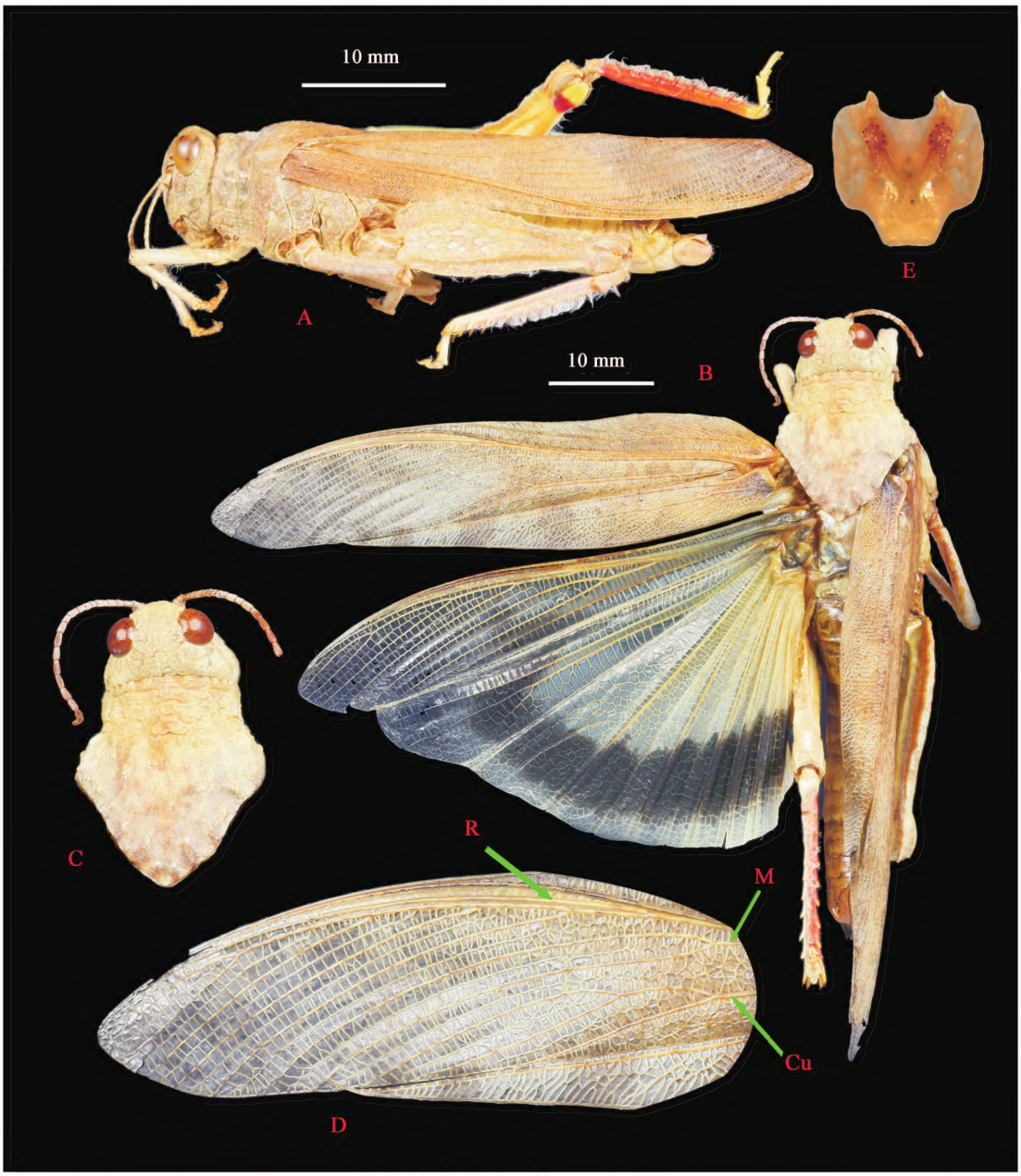

Fig. 1　*Tuarega sahara* sp. nov.
A: Lateral view ♂; B: Dorsal view ♀; C: Dorsal view of head and pronotum ♀; D: Tegmen, showing R, M and Cu veins ♀; E: Epiphallus ♂.

Ovipositor valves blackish.

Measurements (in mm): Length of body: ♂ 37.8 – 38.4; ♀60.1. Length of tegmina: ♂ 37.7 – 38.9; ♀58.3. Length of pronotum: ♂ 10.4 – 10.9; ♀ 15.1. Length of hind femur: ♂ 17.0 – 17.1; ♀24.2.

Diagnosis: *Tuarega sahara* sp. nov. is similar to *T. insignis*, but it differs from the latter in four characters (Table 1).

Distribution: Known from the type locality only.

Etymology: The specific epithet is named after the type locality, Sahara.

Table 1 Comparison of *Tuarega sahara* sp. nov., *Tuarega parisi* sp. nov. and *Tuarega insignis* (Lucas, 1851)

	Tuarega sahara sp. nov.	*Tuarega insignis* (Lucas, 1851)	*Tuarega parisi* sp. nov.
Widest width of pronotum	Longer than length of metazona	Shorter than length of metazona	Longer than length of metazona
Tegmen	Median vein not combined with cubital vein	Median vein combined with cubital vein at end	Median vein not combined with cubital vein
Radius vein of tegmen	With 5 branches	With 7 branches	With 7 branches
Median vein of tegmen	With 1 branch only	With 1 branch only	With 2 branches
Cubital vein of tegmen	With 2 branches	With 3 branches	With 2 branches

3 *Tuarega parisi* sp. nov. (Fig. 2: A, B, C, D)

Holotype ♀, Tieguerremtz. Draa, Sahara Espanol, collected by J. Mateu in April 28 – May 2, 1944 (MNCN_Ent N°Cat 37016). Paratype: 1 ♀ Smara, SG. H., Sahara Espanol, collected in May, 1942 (MNCN_Ent N°Cat 37020).

Female. Body large and robust. Integument strongly rugose and dense hairs, especially on the hind leg. Head subglobular, shorter than length of pronotum; fastigium of vertex short, wide, slightly sloping forwards and slightly concave, with fastigial furrow obliterated; frons vertical; frontal ridge low, above ocellus flat and below it concave, in basal part obliterated. Eyes oval, longitudinal diameter 1.4 times the horizontal diameter and shorter than subocular furrow slightly. Antennae filiform, slightly shorter than head and pronotum together, length of a segment 3 times width in the middle part. Pronotum in prozona almost cylindrical, metazona flatted; median carina weak, linear, crossed by three weak sulci; lateral carinae absent; metazona longer than prozona and shorter than the widest width of pronotum; its posterior margin elongated and angular, with obtuse apex. Prosternum with very low collar. Mesosternal interspace wider, width 2 times its length. Tegmina and hind wings fully developed, surpassing the end of abdomen distinctly. Tegmina radius vein (R) with 7 branches; median vein (M) with 2 branches; cubital vein (Cu) not combined with median vein; cubital vein with 2 branches only. Tibia of second leg with a row of tubercles on upper side. Hind femur moderately robust, with slightly expanded marginal areas, length almost equal to 3 times of width of broadest part. Hind tibia with small apical spine on inner and outer side, with 9 spines on upper margin of external and internal side (including apical spine). Arolium small. Subtympanal lobe large. Krauss' organ developed. First abdominal tergite above with large, ridge-like convexity. Cerci short, apex obtuse. Ovipositor moderately short, slender, valves curved, apex acute; lower valve with large projection on the basal part.

Coloration. Body yellowish-brown. Eyes dark brown. Tegmina reddish-brown. Hind wing yellow at basal half part, with a dark strongly curved band reaching from the apical fourth to the posterior margin, but not reaching the outer margin. Hind femora yellowish-brown, inner genicular lobe darkish-red at base. Hind tibiae yellowish-brown on outer side and red on inner side. Ovipositor valves blackish.

Male. Unknown.

Measurements (in mm): Length of body: ♀ 58.1 – 61.1; Length of tegmen: ♀57.8; Length of pronotum: ♀16.6 – 17.7; Length of hind femur: ♀23.4 – 27.1.

Diagnosis: *Tuarega parisi* sp. nov. is similar to *T. insignis* and *Tuarega sahara* sp. nov., but it differs from the two species in four characters and two characters (Table 1).

Distribution: Known from the type locality only.

Etymology: The specific epithet is named after Mr. Mercedes París for commemorating his help with providing the type specimens.

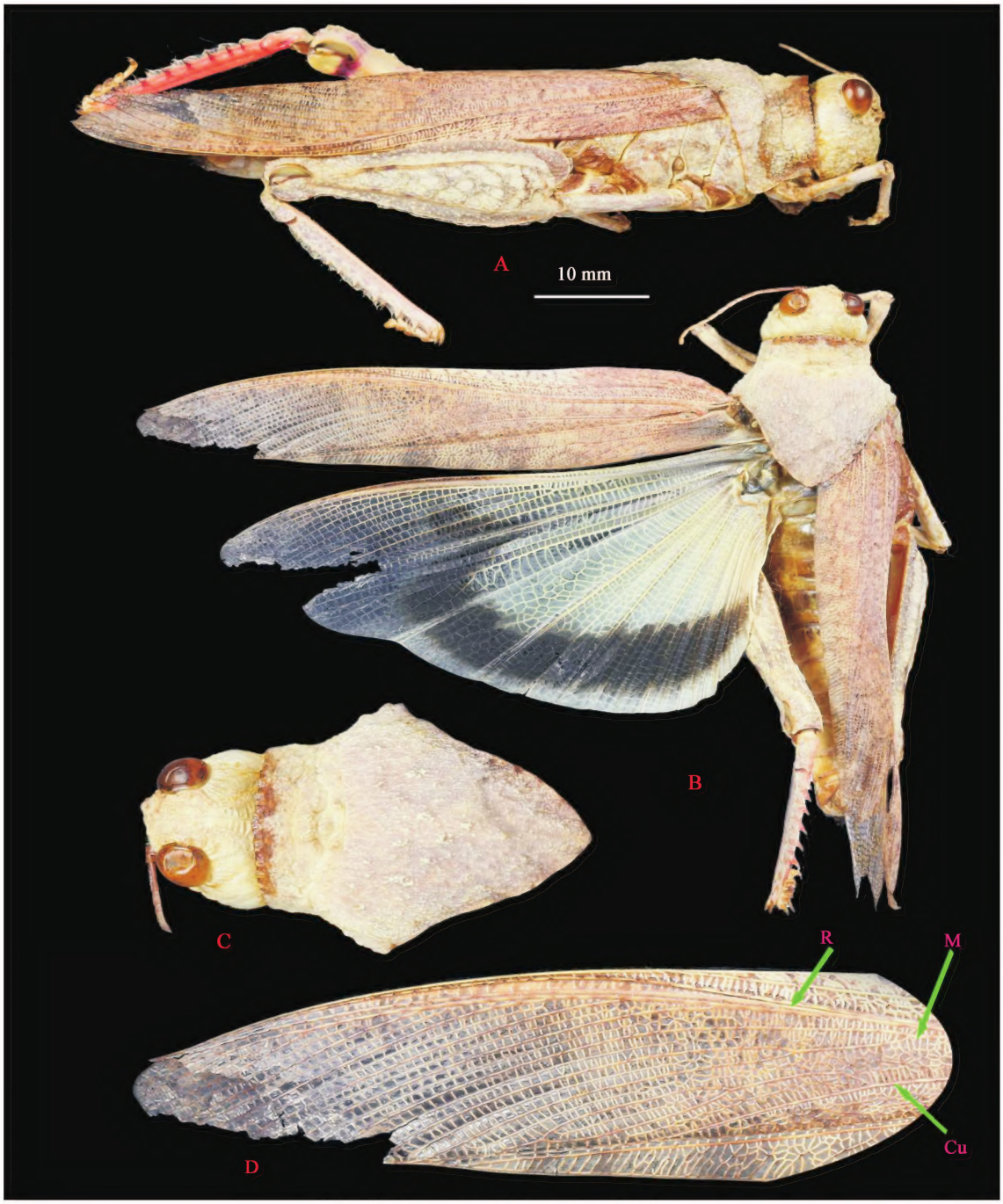

Fig. 2 *Tuarega parisi* sp. nov. female
A: Lateral view; B: Dorsal view; C: Dorsal view of head and pronotum; D: Tegmen, showing R, M and Cu veins.

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土尔蝗属分类研究及撒哈拉地区二新种记述
(直翅目：蝗总科：癞蝗科：锯癞蝗亚科)

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摘要：本文对土尔蝗属 *Tuarega* Uvarov，1943 进行了分类研究，记述了撒哈拉地区 2 新种——撒哈拉土尔蝗 *Tuarega sahara* sp. nov. 和巴氏土尔蝗 *Tuarega parisi* sp. nov.，并编制了该属 3 个已知种的检索表。新种模式标本保存于西班牙国立自然博物馆(Museo Nacional de Ciencias Naturales)。

关键词：直翅目；癞蝗科；土尔蝗属；分类；新种

中图分类号：Q969　　**文献标识码**：A　　**文章编号**：0454-6296(2011)01-0097-07

附录：新种简记

撒哈拉土尔蝗，新种 *Tuarega sahara* sp. nov.(图 1：A，B，C，D，E)

该新种同 *T. insignis* (Lucas，1851)近似，不同之处为前胸背板最宽处的宽度大于沟后区的长度，前翅中脉(M)和肘脉(Cu)端部不会合，前翅径脉(R)具 5 个分支，肘脉具 2 个分支。

体长：♂37.8～38.4 mm，♀60.1 mm。前胸背板长：♂10.4～10.9 mm，♀15.1 mm。前翅长：♂37.7～38.9 mm，♀58.3 mm。后足股节长：♂17.0～17.1 mm，♀24.2 mm。

正模♂，Mehangat，Seguiat el mamara，Sahara，1944-III-23，J. Mateu 采；副模：1 ♂，Doar，Seguiat el Hamara，Sahara，1945-IV-4，J. Mateu 采；1 ♂，Smara，Seguiat el Mamara，Sahara，1943-VII-20；1 ♀，Beni-Abbes，Sahara Algeria，1951-III-27，J. Mateu 采。

巴氏土尔蝗，新种 *Tuarega parisi* sp. nov.(图 2：A，B，C，D)

该新种同 *T. insignis* (Lucas，1851)近似，不同之处为前胸背板最宽处的宽度大于沟后区的长度，前翅中脉(M)和肘脉(Cu)端部不会合，前翅中脉具 2 个分支，肘脉具 2 个分支。新种同撒哈拉土尔蝗 *Tuarega sahara* sp. nov. 也近似，不同之处为前翅径脉(R)具 7 个分支，中脉具 2 个分支。

体长：♀58.1～61.1 mm。前胸背板长：16.6～17.7 mm。前翅长：57.8 mm。后足股节长：♀23.4～27.1 mm。

正模♀，Tieguerremtz. Draa，Sahara，1944-IV-28 至 V-2，J. Mateu 采；副模：1♀，Smara，SG. H.，Sahara，1942-V。

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